

SIPZ-DRS-00215482-01-5100

February 20, 2014



**Siplast**

**Dynamic Wind Load Testing  
in Accordance with CSA  
A123.21-10**

Type of document :  
Final

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## Siplast

### Dynamic Wind Load Testing in Accordance With CSA A123.21-10

Type of Document:  
Final

Project Name:  
Partly adhered roofing system – Protectoboard with asphalt

Project Number:  
SIPZ-DRS-00215482-01-5100

Prepared By:  
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Michel Desgranges, P.T.  
Director Roofing & Waterproofing  
OTPQ n° 18788

Date Submitted:  
February 20, 2014



## Legal Notification

This report was prepared by Les Services **exp** Inc. for the account of **Siplast**.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Les Services **exp** Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.



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## 1. Summary

Les Services **exp** Inc. (**exp**) tested the following assembly in accordance with the CSA A123.21-10 Standard test method for the dynamic wind uplift resistance of membrane-roofing systems, method 2:

- Metal deck;
- DensDeck Prime mechanically attached with 6 screws and plates for each panel;
- Vapour barrier, Tradesman SA Glass Base, Self-adhered;
- Insulation, AC Foam IV, fully bonded with hot bitumen;
- Recovery Board, ProtectoBoard, fully bonded with hot bitumen;
- Paradiene 20, fully bonded with hot bitumen;
- Paradiene 30 TG welded.

The initial test pressure was established at 2.2 kPa (45 psf) by Siplast.

The system sustained a pressure of 4.3 kPa (90 psf).

As required by the CSA A123.21 standard, the published dynamic uplift resistance (DUR) must be reduced by a safety factor of 1.5. Therefore, the rating of the tested assembly is 2.9 kPa (60 psf).



## 2. Testing Apparatus and Method

### Test Method:

Testing was conducted in accordance with CSA A123.21-10, Standard test method for the dynamic wind uplift resistance of membrane-roofing systems. This test method determines the wind uplift resistance of membrane-roofing systems when subjected to dynamic wind load cycles. The roofing system consists of a deck and roofing membrane and may include components such as air/vapour barrier, insulation and cover board. The roofing assembly is subjected to a simulated dynamic load sequence which was developed based on wind pressure records. Testing in accordance with this test method is limited to mechanically attached, reinforced membrane systems having a fastener row separation not greater than 2896 mm (114 in.) and a fastener in-line spacing not greater than 610 mm (24 in.).

### Test apparatus:

The test apparatus consists of a top pressure vessel mounted on a height-adjustable bottom frame that is fixed to the floor and on which the test specimen was installed. The pressure vessel was connected to fans and incorporates a gust simulator which consists of a flap valve connected to a stepping motor capable of simulating wind gust as per CSA A123.21-10 standard requirements. The pressure vessel has interior dimensions of  $6100 \pm 50$  mm ( $240 \pm 2$  in.) x  $2200 \pm 50$  mm ( $87 \pm 2$  in.) x  $800 \pm 50$  mm ( $31 \pm 2$  in.) high and can withstand a minimum of 20 kPa (400 psf) suction pressure. It incorporates six viewing windows and a gust simulator capable of producing a minimum suction of 10 kPa (200 psf) over the roof assembly. The roof deck was installed on structural purlins with spacing of 1829 mm (6 ft.) o.c. Air leakage was minimized to facilitate the control of the test pressure that is applied over the assembly. The apparatus has a pressure-measuring device capable of measuring pressure differential within a tolerance of  $\pm 0.05$  % of full-scale pressure or  $\pm 10$  Pa ( $\pm 0.2$  psf), whichever is smaller. A pressure sensor was installed at each of the following two locations:

- (a) Inside of the chamber, to provide reference pressure;
- (b) On top of the membrane, to measure the simulated pressure.

Instruments and sensors used for the reported data were calibrated by N.R.C.C., in May of 2010.



### 3. Test Specimen Details

#### Installation

Date of installation: November 19 & 21 2013  
Installed by: Todd Corley and Zach Taylor  
Supervised by: Todd Corley (Siplast) and Denis Isabelle  
Tested by: Denis Isabelle  
Curing temperature: 19°C @ 21°C  
Testing temperature: 19°C  
Elapsed time between construction and testing: ± 4 days

#### Structural deck

Type: Profiled metal sheeting, 22 gauge  
Tested according to: ASTM A 653M SS  
Nominal thickness: 0.76 mm (0.030 in.)  
Overall depth: 38 mm (1.5 in.)  
Support spacing o/c: 2 m (6'-6")  
Fastener layout: At every flute

#### Thermal Barrier

Product: DensDeck Prime  
Dimensions: 1.22 m x 1.52 m 12.7 mm (4 ft x 5 ft x ½ in.)  
Attachment: screws and plates  
Manufacturer: Georgia-Pacific

#### Attachement details

Type: Screws and Plates  
Attachment: n° 12 Scews and plates (76 mm)  
Fastening pattern: 6 screws and plates per panel (see fastener placement in appendix A)  
Manufacturer: Siplast

#### Vapour Barrier/Vapour Retarder

Type: Tradesman SA Glass Base  
Dimensions: 20.2 m x 1000 mm  
Attachment method: Self adhered  
Manufacturer: Siplast

### Thermal Insulation

Type:	Polyisocyanurate AC Foam IV
Description:	It is constructed from closed cell polyisocyanurate foam core bonded on each side to fiber-reinforced facers during the manufacturing process.
Dimensions:	1220 mm x 1220 mm x 51 mm (4'x4'x2")
Attachment:	Fully bonded with hot bitumen.
Compressive strength:	20 psi as per ASTM D 1621 standard.
Manufacturer:	Atlas Roofing Corporation

### Recovery Board

Product:	ProtectoBoard
Description:	Is a semi-rigid protection board composed of a mineral fortified asphaltic core formed between two saturated fibreglass felts.
Dimensions:	1.22 m x 1.52 m 12.7 mm (4 ft x 5 ft x ½ in.)
Attachment:	Fully bonded with hot bitumen.
Manufacturer:	Iko

### Membranes: Base sheet

Product:	Paradiene 20
Reinforcement:	Glass mat
Manufacturer:	Siplast

### Attachement details:

Type:	Bitumen
Adhesive details:	Bitumen type II
Fastening pattern:	Fully bonded
Manufacturer:	BP (upon roofer's information)

### Membranes: Cap sheet

Product:	Paradiene 30 TG
Reinforcement:	Glass mat
Manufacturer:	Siplast

### Membrane attachment details:

Type:	Heat welded
Manufacturer:	Silpast



## 4. Test Results

Testing and results are in accordance with CSA A123.21-10 Standard test method for dynamic wind uplift resistance of membrane-roofing systems, Method 2.

### System tested:

- Metal deck;
- DensDeck Prime mechanically attached with 6 screws and plates for each panel;
- Vapour barrier, Tradesman SA Glass Base, Self-adhered;
- Insulation, AC Foam IV, fully bonded with hot bitumen;
- Recovery Board, ProtectoBoard, fully bonded with hot bitumen;
- Paradiene 20 fully bonded with hot bitumen;
- Paradiene 30 TG welded.

**Differences of the test specimen from the client's specifications:** None

### Test pressure:

The initial test pressure was established at 2.2 kPa (45 psf) by IKO Industries Ltd.

The system sustained a pressure of 4.3 kPa (90 psf).

As required by the CSA A123.21 standard, the published dynamic uplift resistance (DUR) must be reduced by a safety factor of 1.5. Therefore, the rating of the tested assembly is 2.9 kPa (60 psf).

**System failed pressure:** System passed all 5 levels.

**Mode of failure:** None

**General Conditions:** The indicated test data is valid for the tested assembly only. This test report shall not be considered as valid should any other products than those identified herein be used for application.



## 5. Equivalent and Optional Products

At the client's request, an assessment should be conducted to determine the suitability of optional and equivalent products which could be used in the tested assembly, without affecting results. The assessment would be based on information provided by the client at the time of testing and on research conducted by the National Research Council of Canada.

### Description:

**Equivalent products:** Components that can replace the products tested in the assembly. They may not be equivalent in their physical properties but are considered as equivalent for their wind uplift performance in the tested assembly. Only the equivalent products listed below can replace the tested products.

**Optional components:** Products which can be inserted in the assembly without adversely affecting wind uplift performance.

The following equivalent and optional components that should be included in the published report.

Equivalent products should be:

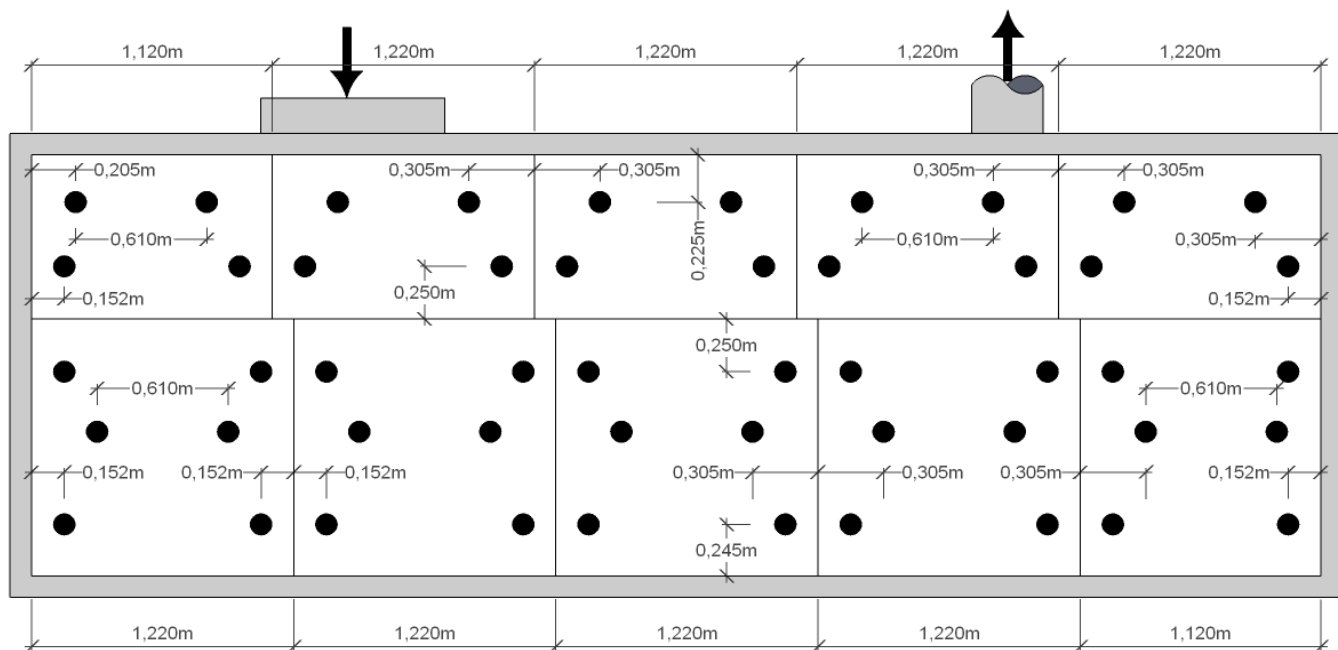
- Different cap sheet (to be analyzed);
- Different sublayers (to be analyzed);
- Different insulation panel;
- Thermal barrier;
- Deck.

Optional components:

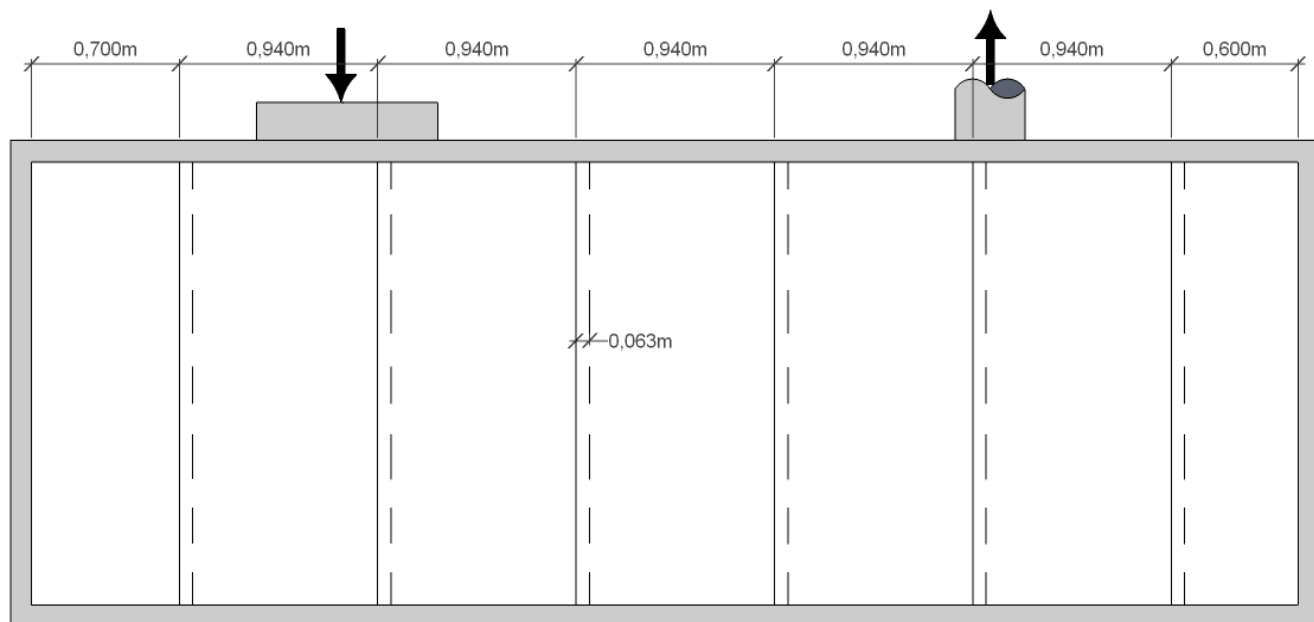
N/A



## Appendix 1 Drawings



### Thermal Barrier (DensDeck Prime) Layout



### Vapour Barrier (Tradesman SA) Layout



**2555, Saint-Pierre Street  
Drummondville (Québec)  
J2C 7Y2  
Phone: 819-477-3775  
Fax: 819-478-8436**

**Project:**  
Partly adhered roofing system – Protectoboard with asphalt

**Title:** Thermal barrier and vapour barrier Layout

Drawn by: **ISD**

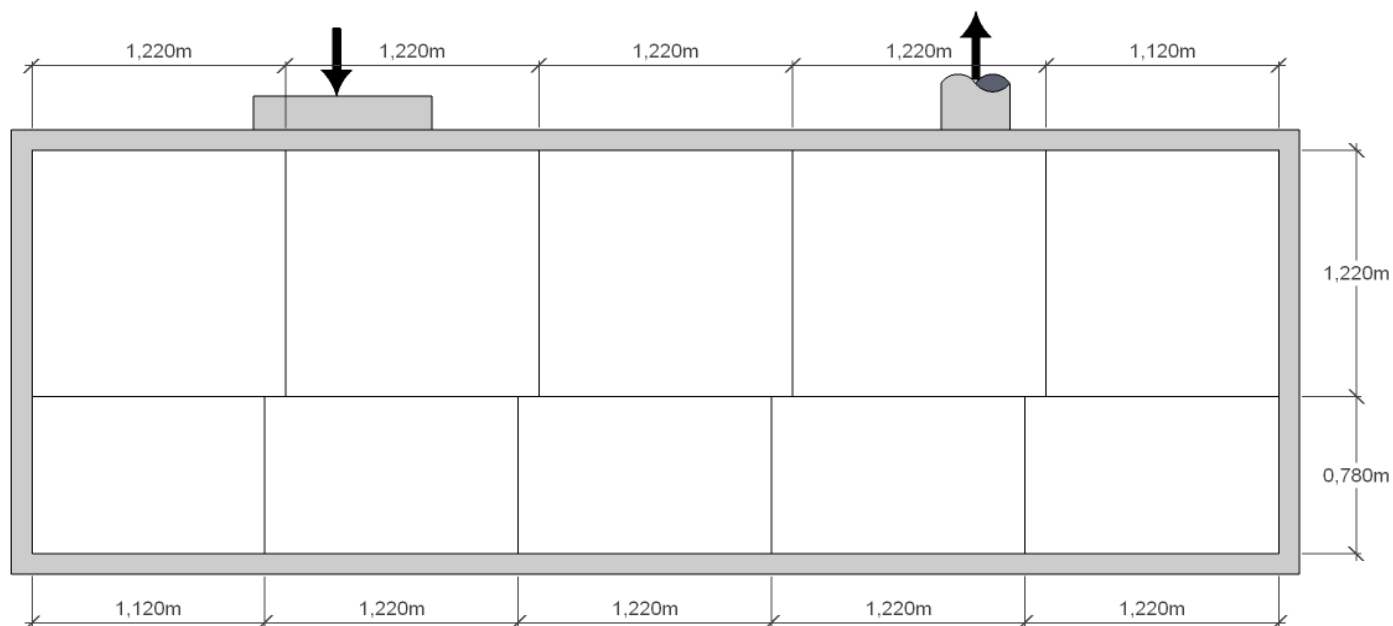
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SIPZ-00215482-01-5100**

**Drawing N°:**

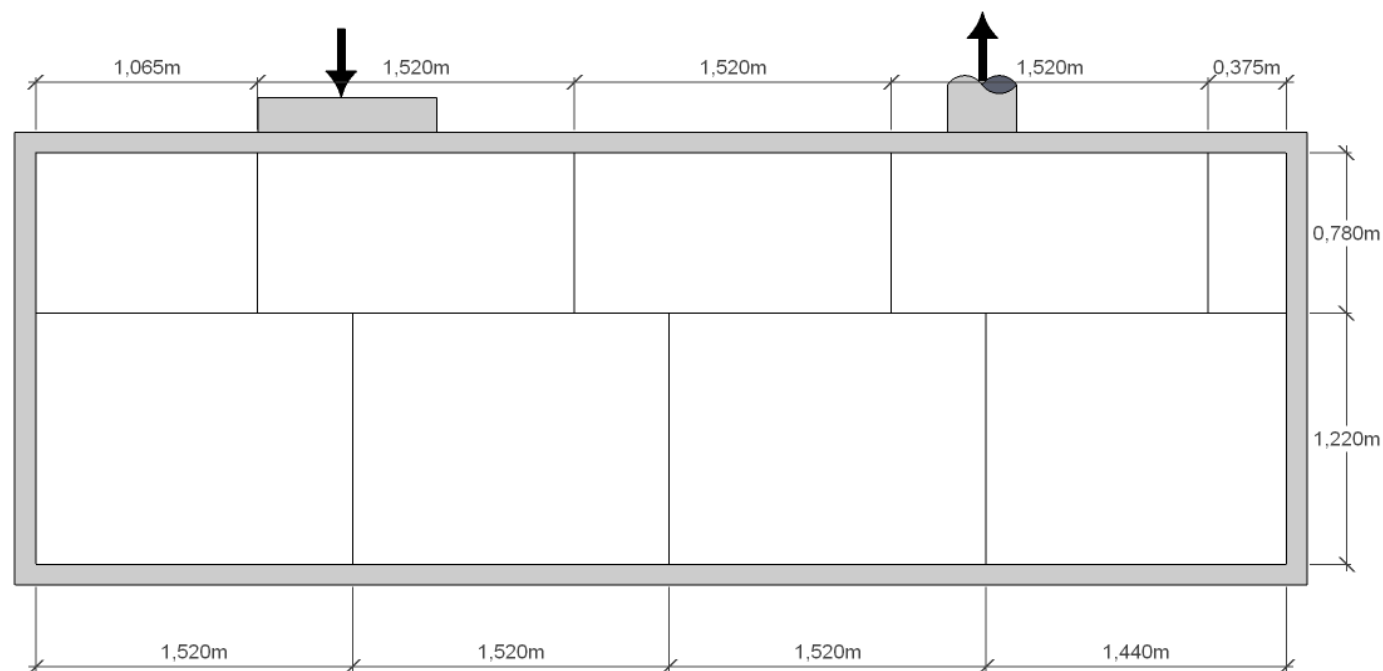
Date: **November 21, 2013**

Scale: **NTS**

**L - 1**



Insulation AC Foam IV Layout



Recovery board (Protecto Board) Layout



2555, Saint-Pierre Street  
Drummondville (Québec)  
J2C 7Y2  
Phone: 819-477-3775  
Fax: 819-478-8436

**Project:**  
Partly adhered roofing system – Protectoboard with asphalt.

**Title:**  
**Insulation and Recovery Layout**

**Drawn by:**  
**ISD**

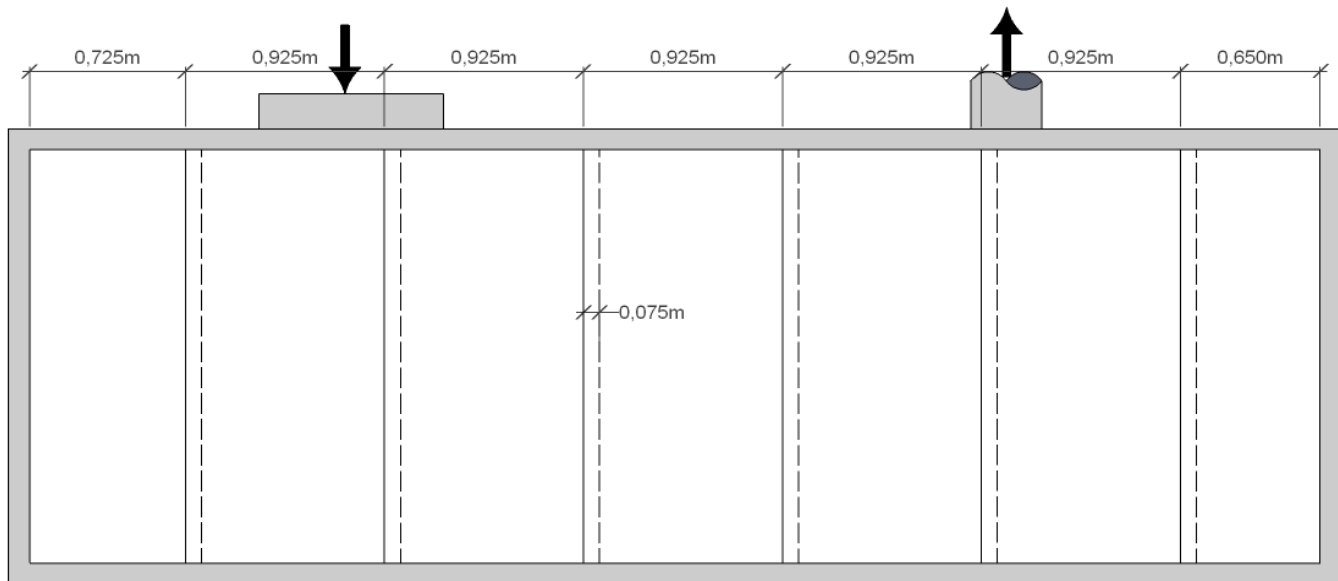
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SIPZ-00215482-01-5100

**Drawing N°:**

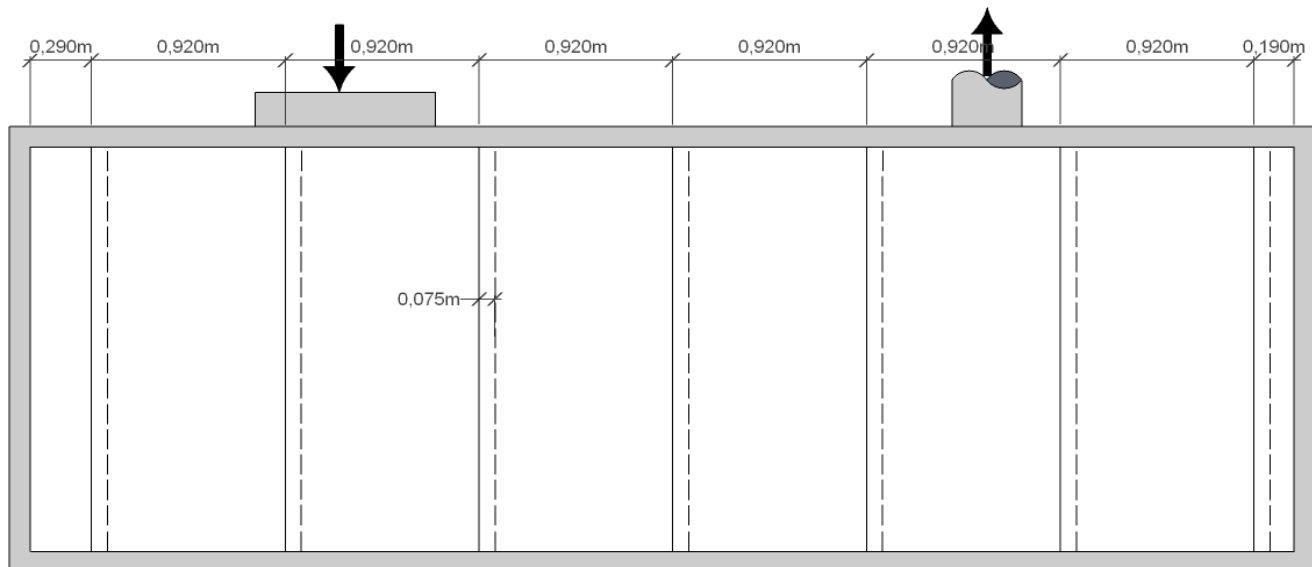
**Date:**  
**November 21, 2013**

**Scale:**  
**NTS**

**L - 2**



Base Sheet (Paradien 20) Layout



Cap Sheet (Paradien 30 TG) Layout



2555, Saint-Pierre Street  
Drummondville (Québec)  
J2C 7Y2  
Phone: 819-477-3775  
Fax: 819-478-8436

**Project:**  
Partly adhered roofing system – Protectoboard with asphalt

**Title:**  
**Base Sheet and Cap Sheet Layout**

**Drawn by:**  
**ISD**

**Project N°:**  
SIPZ-00215482-01-5100

**Drawing N°:**

**Date:**  
**November 21, 2013**

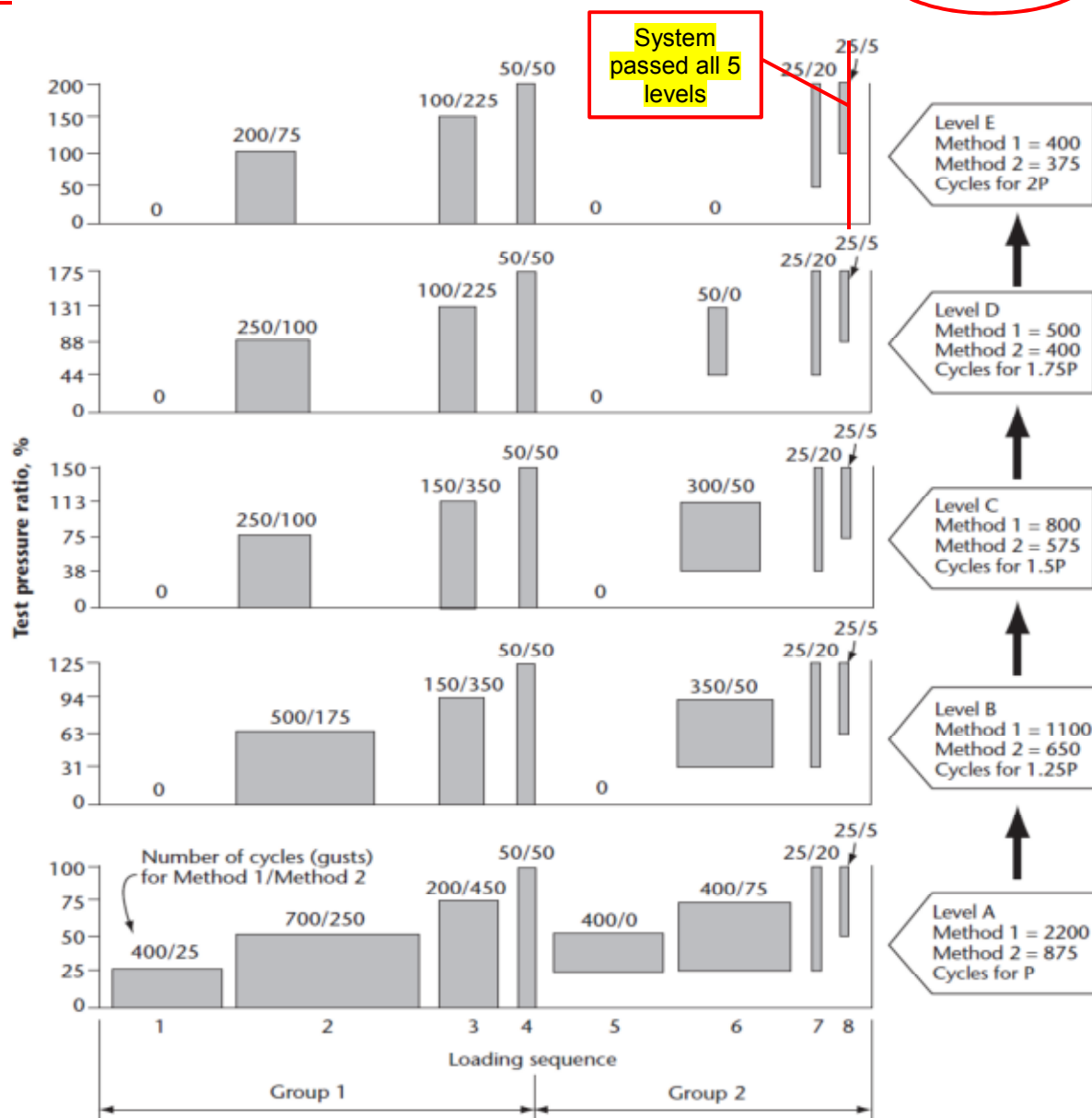
**Scale:**  
**NTS**

**L - 3**

## **Appendix 2**

### **Gusts and Load Amplitude Pressure Table And Fastener Pullout test**

## Dynamic wind load cycles for Method 1/Method 2





Pullout tests anchors on steel deck (Parafast Pa n° 12)		
Test No.	Measured Load (psi)	Load in lbf <sup>1</sup>
1	225	470,34
2	210	432,05
3	255	546,91
4	220	457,57
5	250	534,15
6	215	444,81
7	225	470,34
8	240	508,62
9	250	534,15
10	240	508,62
Total	2330	4907,6
Average	233	490,76


<sup>1</sup>Load in lbf = (Measured load (psi) x 2,5526) - 104

**Date :** 2013-11-22

**Technicien :** Denis Isabelle

## **Appendix 3**

### **Photographic Report**

<b>Photographic Report</b>		
<b>Client :</b> Siplast	<b>Date :</b> <u>19 et 21</u> - <u>11</u> - <u>2013</u> DD MM YYYY	
<b>Project :</b> Partly adhered roofing system – Protectoboard with asphalt	<b>Project n° :</b> SIPZ-DRS-00215482-01-5100	

**Photo n° :** 1

**Description :**

Metal deck before the installation of the roof assembly.



**Photo n° :** 2

**Description :**

Thermal barrier. DensDeck Prime mechanically attached




Photographic Report		
Client : Siplast	Date : <u>19 et 21</u> - <u>11</u> - <u>2013</u> DD MM YYYY	
Project : Partly adhered roofing system – Protectoboard with asphalt	Project n° : SIPZ-DRS-00215482-01-5100	

Photo n° : 3

**Description :**

Removing the protective film for the underlayment.




Photo n° : 4

**Description :**

Pass the roll marouffleur onto the vapour barrier.

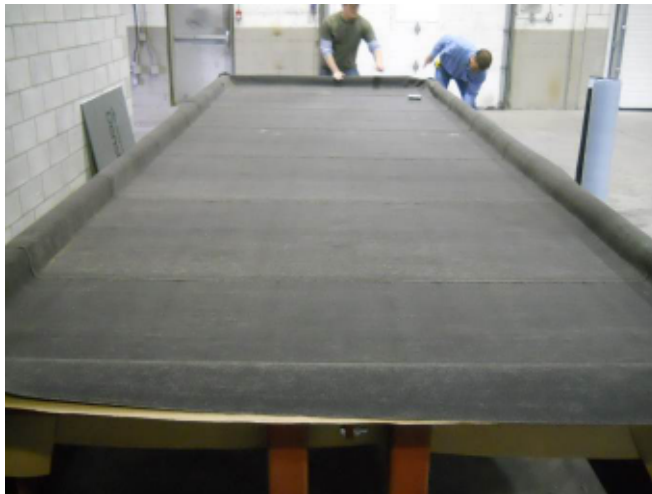


<b>Photographic Report</b>		
<b>Client :</b> Siplast	<b>Date :</b> <u>19 et 21</u> - <u>11</u> - <u>2013</u> DD MM YYYY	
<b>Project :</b> Partly adhered roofing system – Protectoboard with asphalt	<b>Project n° :</b> SIPZ-DRS-00215482-01-5100	

**Photo n° :** 5

**Description :**

Overview of the vapour barrier, Tradesman SA.




**Photo n° :** 6

**Description :**

Installation of insulation, AC Foam IV, fully bonded in hot bitumen.



<b>Rapport photographique</b>		
<b>Client :</b> Siplast	<b>Date :</b> <u>19 et 21</u> - <u>11</u> - <u>2013</u> DD MM YYYY	
<b>Project :</b> Partly adhered roofing system – Protectoboard with asphalt	<b>Project n° :</b> SIPZ-DRS-00215482-01-5100	

**Photo n° :** 7

**Description :**

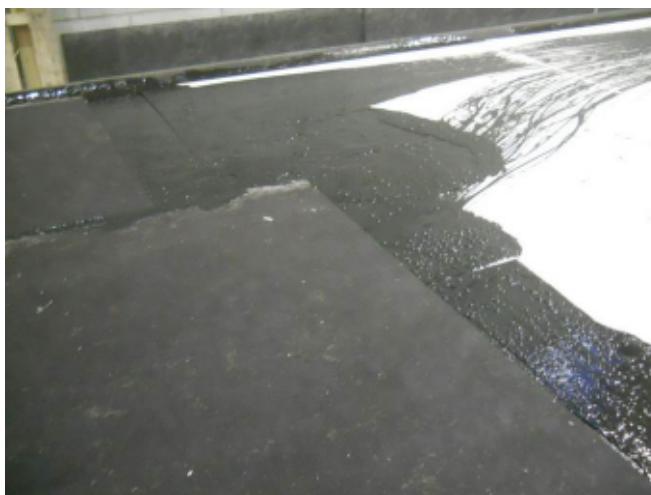
Overview of the insulation.




**Photo n° :** 8

**Description :**

Installation of the recovery board, ProtectoBoard, fully bonded in hot bitumen.



<b>Rapport photographique</b>		
<b>Client :</b> Siplast	<b>Date :</b> <u>19 et 21</u> - <u>11</u> - <u>2013</u> DD MM YYYY	
<b>Project :</b> Partly adhered roofing system – Protectoboard with asphalt.	<b>Project n° :</b> SIPZ-DRS-00215482-01-5100	

**Photo n° :** 9

**Description :**

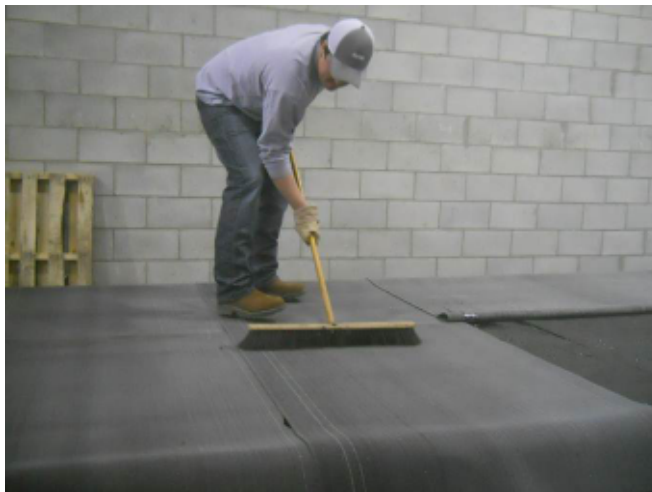
Overview of the ProtectoBoard.




**Photo n° :** 10

**Description :**

Pass a broom on the membrane sublayer, Paradiene 20.



<b>Photographic Report</b>		
<b>Client :</b> Siplast	<b>Date :</b> <u>19 et 21</u> - <u>11</u> - <u>2013</u> DD MM YYYY	
<b>Project :</b> Partly adhered roofing system – Protectoboard with asphalt	<b>Project n° :</b> SIPZ-DRS-00215482-01-5100	

**Photo n° :** 11

**Description :**

Installation of the base sheet, Paradiene 20, fully bonded in hot bitumen.




**Photo n° :** 12

**Description :**

Heat welding of the cap sheet to the base sheet.





<b>Photographic Report</b>		
<b>Client :</b> Siplast	<b>Date :</b> <u>19 et 21</u> - <u>11</u> - <u>2013</u> DD MM YYYY	
<b>Project :</b> Partly adhered roofing system – Protectoboard with asphalt	<b>Project n° :</b> SIPZ-DRS-00215482-01-5100	

**Photo n° :** 13

**Description :**

Overview of assembly.




**Photo n° :** 14

**Description :**

Progress in the advancement of the test for the system.

Sequence : A-1-4  
Gust : 1/50



<b>Photographic Report</b>		
<b>Client :</b> Siplast	<b>Date :</b> <u>19 et 21</u> - <u>11</u> - <u>2013</u> DD MM YYYY	
<b>Project :</b> Partly adhered roofing system – Protectoboard with asphalt	<b>Project n° :</b> SIPZ-DRS-00215482-01-5100	

**Photo n° :** 15

**Description :**

Progress in the advancement of the test for the system.

Sequence : B-2-6  
Gust : 15/50




**Photo n° :** 16

**Description :**

Progress in the advancement of the test for the system.

Sequence : C-2-6  
Gust : 30/50



<b>Photographic Report</b>		
<b>Client :</b> Siplast	<b>Date :</b> <u>19 et 21</u> - <u>11</u> - <u>2013</u> DD MM YYYY	
<b>Project :</b> Partly adhered roofing system – Protectoboard with asphalt	<b>Project n° :</b> SIPZ-DRS-00215482-01-5100	

**Photo n° :** 17

**Description :**

Progress in the advancement of the test for the system.

Sequence : D-1-4  
Gust : 26/50



**Photo n° :** 18

**Description :**

Progress in the advancement of the test for the system.

Sequence : E-1-2  
Gust : 37/75



## **Appendix 4**

### **Technical Data Sheets**

## Manufacturer

Georgia-Pacific Gypsum LLC      Georgia-Pacific Canada LP  
 133 Peachtree Street      2180 Meadowvale Boulevard, Suite 200  
 Atlanta, GA 30303      Mississauga, ON L5N 5S3  
 Technical Service Hotline: 1-800-225-6119

## Description

**DensDeck® Prime Roof Board** has been enhanced to provide a broader compatibility and higher performance with roofing adhesives. Face mat enhancements allow adhesives to be applied more uniformly and consistently. In adhered, single ply membrane testing, enhanced DensDeck Prime demonstrated an average of 24% better bond than the original products, when using solvent based adhesives. (Average based on 60 sq.ft./gal coverage rates.)\* Choose DensDeck Prime Roof Boards for adhered and self-adhered "peel & stick" roofing systems, as well as hot mopped, cold mastic and torch-applied modified bitumen roofs. Enhanced DensDeck Prime Roof Boards create a stronger and more economical installation by reducing the amounts of mastic or adhesive used and potentially eliminates the field primer. Consult with membrane manufacturer for actual priming requirements.

DensDeck Prime Roof Boards are the first and only fiberglass mat gypsum roof boards with a 90-day weather exposure limited warranty when applied vertically on a parapet wall. \*\* (Limited to 1/2" and 5/8" products only.)

## Primary Uses

Roof system manufacturers and designers have found DensDeck Prime Roof Board to be compatible with many types of roofing systems, including: modified asphalt, single-ply, metal systems, recover board, as well as an overlayment for polyisocyanurate and polystyrene insulation. DensDeck Prime Roof Board can also be used as a form board for poured gypsum concrete deck in roof applications as well as a substrate for spray foam roofing systems. 1/2" (12.7 mm) and 5/8" (15.9 mm) DensDeck Prime Roof Board may also be used in vertical applications as a backer board or liner for the roof side of parapet walls.

DensDeck Prime Roof Board may allow the bonding of cold mastic modified bitumen and torching directly to the surface. *Consult with the system manufacturer for recommendations on this application.*

DensDeck Prime Roof Board is the preferred substrate for vapor retarders.

## Standards and Code Approvals

DensDeck Prime Roof Boards are manufactured to meet ASTM C1177 and have the following approvals:

- Florida Product Approved
- Miami-Dade County Product Control Approved

## Recommendations and Limitations

DensDeck Prime Roof Boards are manufactured to act with a properly designed roof system following good roofing practices. The actual use of DensDeck Prime Roof Board as a roofing component in any system or assembly is the responsibility of the roofing system's design authority. Consult with the appropriate system manufacturer and/or design authority for system and assembly specifications and instructions on applying other products to DensDeck Prime Roof Board. Georgia-Pacific does not warrant and is not responsible for any systems or assemblies utilizing DensDeck Prime Roof Board or any component in such systems or assemblies other than DensDeck Prime Roof Board.

The need for a separator sheet between the DensDeck Prime Roof Board and the roofing membrane must be determined by the roof membrane manufacturer or roofing system designer.

\* Testing was done in accordance with FM approvals 4470, Appendix C: Small Scale Tests, Membrane Delamination Tests for Roofing Membranes and Substrates Using Tensile Loading.

\*\* For complete warranty details, visit [www.DensDeck.com](http://www.DensDeck.com). (Limited to 1/2" and 5/8" products only.)

Confirm any priming requirements with the membrane manufacturer. When applying solvent-based adhesives or primers, allow sufficient time for the solvent to flash off to avoid damage to roofing components.

DensDeck Prime Roof Boards should not be subjected to abnormal or excessive loads or foot traffic, such as, but not limited to, use on plaza decks or under steel-wheeled equipment that may fracture or damage the panels. Provide suitable roofing system protection when required.

When using DensDeck Prime Roof Boards for hot-mopped applications, Georgia-Pacific recommends maximum asphalt application temperatures for Type III asphalt of 425°F (218°C) to 450°F (232°C). Application temperatures above these recommended temperatures may adversely affect roof system performance. For application temperatures in excess of 450°F (232°C) and for mopping of type IV asphalt, ribbon or spot mopping or the installation of a perforated base sheet are recommended methods of bonding asphalt in lieu of full mopping. Consult and follow the roofing system manufacturer's specifications for full mopping applications and temperature requirements.

When using DensDeck Prime Roof Board as a substrate for torch applications, ensure that the product is dry and that the proper torching technique is used. Limit the heat to the DensDeck Prime Roof Board. Maintain a majority of the torch flame directly on the roll.

Conditions beyond the control of Georgia-Pacific, such as weather conditions, dew, leaks, application temperatures and techniques may cause adverse effects with roofing systems.

## Handling and Use—CAUTION

This product contains fiberglass facings which may cause skin irritation. Dust and fibers produced during the handling and installation of the product may cause skin, eye and respiratory tract irritation. Avoid breathing dust and minimize contact with skin and eyes. Wear long sleeve shirts, long pants and eye protection. Always maintain adequate ventilation. Use a dust mask or NIOSH/MSHA approved respirator as appropriate in dusty or poorly ventilated areas.

## Moisture Management

**DensDeck Prime Roof Boards, like other components used in roofing systems, must be protected from exposure to moisture before, during and after installation.**

Remove the plastic packaging from all DensDeck Prime Roof Board immediately upon receipt of delivery. Failure to remove the plastic packaging may result in entrapment of condensation or moisture. DensDeck Prime Roof Board stored outside must be stored level and off the ground and protected by a breathable waterproof covering. Provide means for air circulation around and under stored bundles of DensDeck Prime Roof Board. DensDeck Prime Roof Board must be covered the same day as installed.

Avoid application of DensDeck Prime Roof Boards during rain, heavy fog and any other conditions that may deposit moisture on the surface, and avoid the overuse of non-vented, direct-fired heaters during winter months. When roofing systems are installed on new poured concrete or light weight concrete decks or when re-roofing over an existing concrete deck, a vapor barrier should be installed above the concrete to retard the migration of water from the concrete into the roof assembly. Always consult the roofing system manufacturer or design authority for specific instructions for applying other products to DensDeck Prime Roof Boards.

Moisture vapor movement by convection must be eliminated, and the flow of water by gravity through imperfections in the roof system must be controlled. After a leak has occurred, no condensation on the upper surface of the system should be tolerated, and the water introduced by the leak must be dissipated to the building interior in a minimum amount of time.

Although DensDeck Prime Roof Boards are engineered with fiberglass facings and high density gypsum cores, the presence of free moisture can have a detrimental

## Submittal Approvals

Job Name \_\_\_\_\_

*continued* →

Contractor \_\_\_\_\_

Date \_\_\_\_\_

## Stamps / Signatures



effect on the performance of the product and the installation of roofing membranes. For example, hot asphalt applications can blister; torched modified bitumen may not properly bond; and adhesives for single ply membranes may not dry properly. Moisture accumulation may also significantly decrease wind uplift and vertical pull resistance in the system or assembly. DensDeck® Prime Roof Boards containing excessive free moisture content may need to be evaluated for structural stability to assure wind uplift performance.

#### Fire Resistance Classifications

DensDeck Prime Roof Boards are excellent fire barriers over combustible and noncombustible roof decks, including steel decks.

**UL 790 Classification.** DensDeck Prime Roof Boards have been classified by Underwriters Laboratories LLC (UL) for use as a fire barrier over combustible and noncombustible decks in accordance with the ANSI/UL 790 test standard. The UL classification includes a comprehensive Class A, B or C rating. For additional information concerning the UL 790 classification, consult the UL Certification Directory.

**UL 1256 Classification.** DensDeck Prime Roof Boards have also been classified by UL in roof deck constructions for internal (under deck) fire exposure in accordance with the ANSI/UL 1256 Steiner Tunnel test. For additional information concerning the UL 1256 classification, consult the UL Certification Directory.

**FM Class 1 Approvals.** DensDeck Prime Roof Boards are included in numerous roofing assemblies with a Factory Mutual (FM) Class 1 fire rating. 1/4" (6.4 mm) DensDeck

Prime Roof Boards have passed testing under the FM Calorimeter Standard 4450 and have been approved by FM as such for insulated steel deck roofs when installed according to the conditions identified by FM. For more information concerning FM Approvals and FM Class 1 assemblies with DensDeck Prime Roof Boards, consult FM or RoofNav®.

**Type X.** 5/8" (15.9 mm) DensDeck® Prime Fireguard® Roof Boards are manufactured to meet the "Type X" requirements of ASTM C1177 for increased fire resistance beyond regular gypsum board.

**UL Fire Resistance Ratings.** 5/8" (15.9 mm) DensDeck Prime Fireguard Roof Boards are designated as **Type DD** by UL and included in assembly designs investigated by UL for hourly fire resistance ratings. 5/8" (15.9 mm) DensDeck Prime Fireguard Roof Boards may also replace any unclassified 5/8" (15.9 mm) gypsum board in an assembly in the UL Fire Resistance Directory under the prefix "P".

**Flame Spread and Smoke Developed.** When tested in accordance with ASTM E84, DensDeck Prime Roof Boards had Flame Spread 0, Smoke Developed 0.

#### Wind Uplift

DensDeck Prime Roof Boards are included in numerous assemblies evaluated by FM or other independent laboratories for wind uplift performance. For information concerning such assemblies, please visit [www.roofnav.com](http://www.roofnav.com).

#### Physical Properties

Properties	1/4" (6.4 mm)	1/2" (12.7mm)	5/8" (15.9 mm)
Thickness, nominal	1/4" (6.4 mm) ± 1/16" (1.6 mm)	1/2" (12.7 mm) ± 1/32" (.8 mm)	5/8" (15.9 mm) ± 1/32" (.8 mm)
Width, standard	4' (1219 mm) ± 1/8" (3 mm)	4' (1219 mm) ± 1/8" (3 mm)	4' (1219 mm) ± 1/8" (3 mm)
Length, standard	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)
Weight, nominal, lbs./sq. ft. (Kg/m²)	1.2 (5.9)	2.0 (9.8)	2.5 (12.2)
Surfacing	Fiberglass mat with non-asphaltic coating	Fiberglass mat with non-asphaltic coating	Fiberglass mat with non-asphaltic coating
Flexural Strength¹, parallel, lbf. min. (N)	≥40 (178)	≥80 (356)	≥100 (444)
Flute Spanability²	2-5/8" (66.7 mm)	5" (127 mm)	8" (203 mm)
Permeance³, perms (ng/Pa•S•m²)	>30 (>1710)	>23 (>1300)	>17 (>970)
R Value⁴, ft²•°F•hr/BTU (m²•K/W)	.28	.56	.67
Linear Variation with Change in Temp., in/in °F (mm/mm/°C)	8.5 x 10⁻⁶ (15.3 x 10⁻⁶)	8.5 x 10⁻⁶ (15.3 x 10⁻⁶)	8.5 x 10⁻⁶ (15.3 x 10⁻⁶)
Linear Variation with Change in Moisture	6.25 x 10⁻⁶	6.25 x 10⁻⁶	6.25 x 10⁻⁶
Water Absorption⁵, % max	<10	<10	<10
Compressive Strength⁶, psi nominal	900	900	900
Surface Water Absorption, grams, nominal	<2.0	<2.0	<2.0
Flame Spread, Smoke Developed (ASTM E 84)	0/0	0/0	0/0
Bending Radius	4' (1219 mm)	6' (1829 mm)	8' (2438 mm)

1. Tested in accordance with ASTM C473 method B.

2. Tested in accordance with ASTM E661.

3. Tested in accordance with ASTM E96 (dry cup method).

4. Tested in accordance with ASTM C518 (heat flow meter).

5. Specified values per ASTM C1177.

6. Tested in accordance with ASTM C473.



U.S.A. – Georgia-Pacific Gypsum LLC  
 Canada – Georgia-Pacific Canada LP

#### SALES INFORMATION AND ORDER PLACEMENT

U.S.A. Midwest: 1-800-876-4746 West: 1-800-824-7503  
 South: 1-800-327-2344 Northeast: 1-800-947-4497

CANADA Canada Toll Free: 1-800-387-6823  
 Quebec Toll Free: 1-800-361-0486

#### TECHNICAL INFORMATION

U.S.A. and Canada: 1-800-225-6119  
[www.gpgypsum.com](http://www.gpgypsum.com)

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**WARRANTIES, REMEDIES AND TERMS OF SALE** For current warranty information for this product, please go to [www.gpgypsum.com](http://www.gpgypsum.com) and select the product for warranty information. All sales of this product by Georgia-Pacific are subject to our Terms of Sale available at [www.gpgypsum.com](http://www.gpgypsum.com).

#### UPDATES AND CURRENT INFORMATION

The information in this document may change without notice. Visit our website at [www.gpgypsum.com](http://www.gpgypsum.com) for updates and current information.

**CAUTION** For product fire, safety and use information, go to [www.gp.com/safetyinfo](http://www.gp.com/safetyinfo) or call 1-800-225-6119.

**FIRE SAFETY CAUTION** Passing a fire test in a controlled laboratory setting and/or certifying or labeling a product as having a one-hour, two-hour, or any other fire resistance or protection rating and, therefore, as acceptable for use in certain fire rated assemblies/systems, does not mean that either a particular assembly/system incorporating the product, or any given piece of the product itself, will necessarily provide one-hour fire resistance, two-hour fire resistance, or any other specified fire resistance or protection in an actual fire. In the event of an actual fire, you should immediately take any and all actions necessary for your safety and the safety of others without regard for any fire rating of any product or assembly/system.

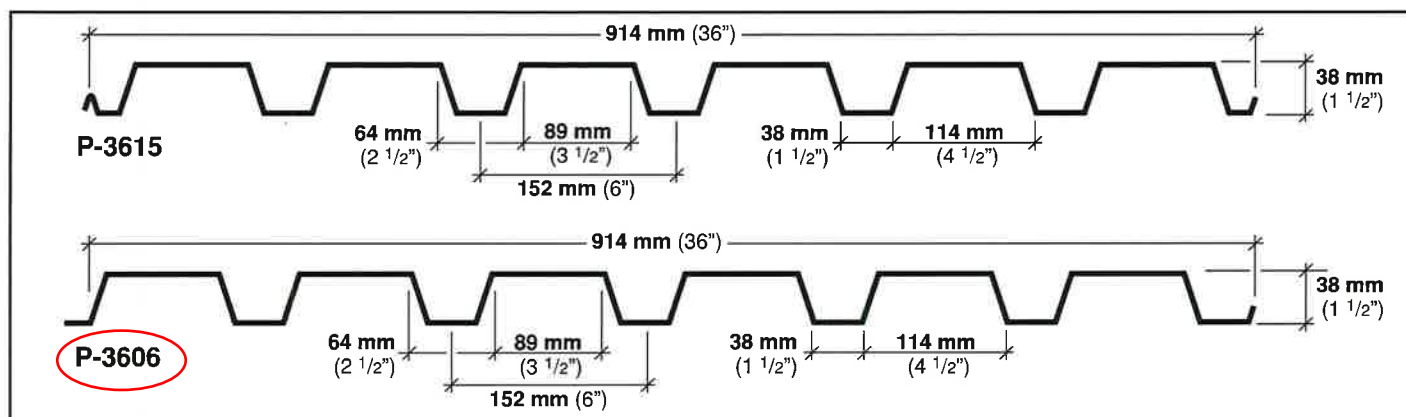
# P-3615 & P-3606

Les tabliers métalliques P-3615 et P-3606 produits par Canam sont des panneaux profilés à froid ayant une largeur de recouvrement totale de 914 mm (36 po).

Ces tabliers sont disponibles en acier galvanisé selon la norme ASTM A 653M avec une désignation de revêtement de zinc Z275 (G90) ou ZF75 (A25). Par suite d'une entente avec un représentant des ventes, il est également possible d'obtenir un tablier profilé à partir d'une tôle d'acier à revêtement d'aluminium-zinc correspondant à l'appellation AZM150 (AZ50) de la norme ASTM A 792M.

Les épaisseurs nominales varient de 0,76 mm (0,030 po) à 1,52 mm (0,060 po). Les nervures ont une profondeur de 38 mm (1,5 po) et sont espacées de 152 mm (6 po) centre à centre. Les longueurs des panneaux peuvent varier de 1 800 mm (6 pi) à 12 200 mm (40 pi).

## DIMENSIONS



## PROPRIÉTÉS PHYSIQUES

Type	Épaisseur nominale	Épaisseur de conception	Profondeur hors-tout	Poids	Module de section		Moment d'inertie pour la flèche
	mm (po)	mm (po)	mm (po)	kg/m <sup>2</sup> (lb/pi <sup>2</sup> )	M <sup>+</sup> mm <sup>3</sup> (po <sup>3</sup> )	M <sup>-</sup> mm <sup>3</sup> (po <sup>3</sup> )	mm <sup>4</sup> (po <sup>4</sup> )
22	0,76 (0,030)	0,762 (0,0300)	37,4 (1,47)	8,50 (1,74)	9 529 (0,1772)	10 081 (0,1875)	202 228 (0,1481)
20	0,91 (0,036)	0,909 (0,0358)	37,5 (1,48)	10,07 (2,06)	11 558 (0,2150)	12 005 (0,2233)	254 750 (0,1865)
18	1,21 (0,048)	1,217 (0,0479)	37,8 (1,49)	13,26 (2,72)	15 813 (0,2941)	15 994 (0,2975)	363 493 (0,2662)
16	1,52 (0,060)	1,511 (0,0595)	38,1 (1,50)	16,34 (3,35)	19 786 (0,3680)	19 786 (0,3680)	452 472 (0,3313)

- Propriétés effectives pour une largeur unitaire de 1 000 mm (12 po).
- Ce tableau a été établi selon la norme CAN/CSA-S136-01.
- Acier selon la norme ASTM A 653M SS Grade 230, limite élastique de 230 MPa (33 ksi).

# P-3615 & P-3606

**TABEAU DES CHARGES PONDÉRÉES ET DE SERVICE (kPa)**

**MÉTRIQUE**

Type		Épaisseur nominale (mm)	PORTÉE (mm)												
			1 200	1 350	1 500	1 650	1 800	1 950	2 100	2 250	2 400	2 550	2 700	2 850	3 000
			PORTÉE SIMPLE												
22	0,76	F	10,69	8,49	6,90	5,72	4,82								
		D	7,60	5,34	3,89	2,92	2,25								
20	0,91	F	12,95	10,29	8,37	6,93	5,84	4,98							
		D	9,58	6,73	4,90	3,68	2,84	2,23							
18	1,21	F	17,70	14,06	11,44	9,48	7,98	6,82	5,89	5,13					
		D	13,66	9,60	7,00	5,26	4,05	3,18	2,55	2,07					
16	1,52	F	22,14	17,59	14,31	11,86	9,99	8,53	7,36	6,42	5,65				
		D	17,01	11,95	8,71	6,54	5,04	3,96	3,17	2,58	2,13				
			PORTÉE DOUBLE												
22	0,76	F	11,11	8,85	7,22	5,99	5,05	4,32	3,73						
		D	18,31	12,86	9,38	7,04	5,43	4,27	3,42						
20	0,91	F	13,23	10,54	8,59	7,14	6,02	5,14	4,44	3,88					
		D	23,07	16,20	11,81	8,87	6,84	5,38	4,30	3,50					
18	1,21	F	17,63	14,05	11,45	9,51	8,02	6,85	5,92	5,17	4,55	4,03	3,60		
		D	32,92	23,12	16,85	12,66	9,75	7,67	6,14	4,99	4,11	3,43	2,89		
16	1,52	F	21,82	17,39	14,17	11,77	9,92	8,48	7,33	6,39	5,63	4,99	4,46	4,00	3,62
		D	40,97	28,78	20,98	15,76	12,14	9,55	7,65	6,22	5,12	4,27	3,60	3,06	2,62
			PORTÉE TRIPLE												
22	0,76	F	(13,60)	10,88	8,90	7,40	6,25	5,35	4,63	4,04					
		D	14,35	10,08	7,35	5,52	4,25	3,34	2,68	2,18					
20	0,91	F	16,19	12,96	10,59	8,82	7,45	6,37	5,51	4,82	4,24	3,77			
		D	18,08	12,70	9,26	6,96	5,36	4,21	3,37	2,74	2,26	1,88			
18	1,21	F	21,59	17,27	14,12	11,75	9,93	8,49	7,35	6,42	5,65	5,02	4,48	4,03	
		D	25,80	18,12	13,21	9,92	7,64	6,01	4,81	3,91	3,22	2,69	2,26	1,93	
16	1,52	F	26,72	21,38	17,47	14,54	12,28	10,51	9,09	7,94	6,99	6,21	5,55	4,98	4,50
		D	32,11	22,56	16,44	12,35	9,52	7,48	5,99	4,87	4,01	3,35	2,82	2,40	2,06

**TABEAU DES CHARGES PONDÉRÉES ET DE SERVICE (lb/pi²)**

**IMPÉRIAL**

Type	Épaisseur nominale (po)	PORTÉE (pi-po)													
		4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
		PORTÉE SIMPLE													
22	0,030	F	216	172	140	116	97								
		D	151	106	78	58	45								
20	0,036	F	262	208	169	140	118	101							
		D	191	134	98	73	57	44							
18	0,048	F	358	285	232	192	162	138	119	104					
		D	272	191	139	105	81	63	51	41					
16	0,060	F	448	356	290	240	202	173	149	130	114				
		D	339	238	173	130	100	79	63	51	42				
		PORTÉE DOUBLE													
22	0,030	F	225	179	146	121	102	87	76						
		D	365	256	187	140	108	85	68						
20	0,036	F	268	214	174	144	122	104	90	78					
		D	459	323	235	177	136	107	86	70					
18	0,048	F	357	285	232	193	162	139	120	105	92	82	73		
		D	655	460	336	252	194	153	122	99	82	68	58		
16	0,060	F	442	352	287	238	201	172	148	129	114	101	90	81	73
		D	816	573	418	314	242	190	152	124	102	85	72	61	52
		PORTÉE TRIPLE													
22	0,030	F	276	220	180	150	127	108	94	82					
		D	286	201	146	110	85	67	53	43					
20	0,036	F	328	263	215	179	151	129	112	98	86				
		D	360	253	184	139	107	84	67	55	45				
18	0,048	F	438	350	286	238	201	172	149	130	114	102	91		
		D	514	361	263	198	152	120	96	78	64	54	45		
16	0,060	F	542	433	354	294	249	213	184	161	142	126	112	101	91
		D	640	449	327	246	189	149	119	97	80	67	56	48	41

- Les charges aux lignes « F » indiquent la charge maximale pondérée en flexion, tandis que celles aux lignes « D » représentent la charge uniforme qui produit une flèche de L/240.
- Les charges aux lignes « F » doivent être comparées aux charges pondérées selon la norme CAN/CSA-S16-01.
- Les charges de service permises pour d'autres critères de flèche sont calculées comme suit : pour 1/180, multiplier par 1,33; pour 1/360, multiplier par 0,66.

- Les valeurs entre parenthèses sont contrôlées par la résistance de l'âme du profilé avec des largeurs d'appui extérieures de 40 mm (1,6 po) et intérieures de 102 mm (4 po).
- La portée est la plus courte des deux longueurs suivantes : la distance centre à centre des supports ou la distance libre entre les supports plus la profondeur du profilé ajoutée à chaque extrémité.
- Les espacements maximums approuvés par Factory Mutual (FM) sont donnés à la page 34.



# PARADIENE 20



## Commercial Product Data Sheet

### Product Description

Paradiene 20 is a high performance modified bitumen base ply designed for use in homogeneous multi-layer modified bitumen roof membrane systems. Paradiene 20 consists of a lightweight random fibrous glass mat impregnated and coated with high quality styrene-butadiene-styrene (SBS) modified bitumen.

### Product Uses

Paradiene 20 is the first ply of all standard Siplast Paradiene 20/30 Systems, and is lapped 3 inches (7.6 cm) side and end. Paradiene 20 can be applied in approved Type IV asphalt or Siplast PA-311 Adhesive. Contact Siplast for specific approval on other product uses.

### Product Approvals

Paradiene 20 is approved by FM Approvals (FM Standard 4470) for use in Siplast Paradiene 20/30, Paradiene 20/30 FR, and Paradiene 20/20 PR Class 1 insulated steel roof deck constructions and insulated and non-insulated concrete roof deck constructions, subject to FM conditions and limitations.

Paradiene 20 is classified by Underwriters Laboratories for use in <sup>c</sup>UL<sub>us</sub> Classified Siplast Paradiene 20/30, Paradiene 20/30 FR, and Paradiene 20/20 PR Roof Systems. Siplast Paradiene 20/30 FR has been classified by Underwriters Laboratories as a Class A roofing system over non-combustible, insulated non-combustible, and insulated combustible decks, and as a Class B roofing system over combustible decks. Siplast Paradiene 20/20 PR has been classified by Underwriters Laboratories as a Class A roofing system over non-combustible and insulated non-combustible decks when surfaced with roofing gravel. Siplast Paradiene 20/30 has been classified as a Class C roofing system over combustible, non-combustible, and insulated combustible decks.

Paradiene 20 meets or exceeds the requirements of ASTM D 6163 Type I, Grade S, for SBS-modified bituminous sheet materials using glass fiber reinforcements.

Siplast Roof Systems also have received the approval of many regional and local authorities. Please contact Siplast for specific information as required.

### COMMERCIAL PRODUCT INFORMATION

Unit:	Roll		
Coverage:	1.5 Squares	(13.9 m²)	
Coverage Weight Per Square:	Min:	62 lb	(3.0 kg/m²)
Roll Length:	Min:	50 ft	(15.24 m)
Roll Width:	Avg:	3.28 ft	(1.00 m)
Thickness:	Avg:	91 mils	(2.3 mm)
	Min:	87 mils	(2.2 mm)
Selvage Width:	N/A		
Selvage Surfacing:	N/A		
Top Surfacing:	Silica Parting Agent		
Back Surfacing:	Silica Parting Agent		

Lines: Two laying lines are placed 3 in (7.6 cm) and 4 in (10.2 cm) from each edge of the material. The line color for this material is white.

Packaging: Rolls are wound onto a compressed paper tube. The rolls are placed upright on pallets cushioned with corrugated cardboard and are adhered with adhesive at the labels. The top of the palletted rolls is covered with foiled Kraft paper. The palletted material is protected by a heat shrink polyethylene shroud.

Pallet: 41 in X 48 in (104 cm X 122 cm) wooden pallet  
Number Rolls Per Pallet: 25  
Number Pallets Per Truckload: 18  
Minimum Roll Weight: 93 lb (42.2 kg)

Storage and Handling: All Siplast roll roofing products should be stored on end on a clean flat surface. Care should be taken that rolls are not dropped on ends or edges and are not stored in a leaning position. Deformation resulting from these actions will make proper installation difficult. All roofing should be stored in a dry place, out of direct exposure to the elements, and should not be double stacked. Material should be handled in such a manner as to ensure that it remains dry prior to and during installation.

*Current copies of all Siplast Commercial Product Data Sheets are posted on the Siplast Web site at [www.Siplast.com](http://www.Siplast.com).*

# PARADIENE 20

## Physical and Mechanical Properties

Property (as Manufactured)	Values/Units	Test Method
Thickness (minimum)	87 mils (2.2 mm)	ASTM D 5147 section 6
Thickness (average)	91 mils (2.3 mm)	ASTM D 5147 section 6
<sup>1</sup> Peak Load @ 73°F (average)	30 lbf/inch (5.3 kN/m)	ASTM D 5147 section 7
<sup>1</sup> Peak Load @ 0°F (average)	70 lbf/inch (12.3 kN/m)	ASTM D 5147 section 7
<sup>1</sup> Elongation @ Peak Load, 73°F (average)	3%	ASTM D 5147 section 7
<sup>1</sup> Elongation @ Peak Load, 0°F (average)	3%	ASTM D 5147 section 7
<sup>1</sup> Ultimate Elongation @ 73°F (average)	50%	ASTM D 5147 section 7
<sup>1</sup> Tear Strength (average)	40 lbf (0.18 kN)	ASTM D 5147 section 8
Water Absorption (maximum)	1%	ASTM D 5147 section 10
Dimensional Stability (maximum)	0.1%	ASTM D 5147 section 11
Low Temperature Flexibility (maximum)	-15°F (-26°C)	ASTM D 5147 section 12
Compound Stability (minimum)	250°F (121°C)	ASTM D 5147 section 16
Cyclic Fatigue	Paradiene 20, bonded to an acceptable Paradiene 30, Paradiene 40 FR, or Parafor 50 LT cap sheet with an approved method of attachment, passes ASTM D 5849 both as-manufactured and after heat conditioning according to ASTM D 5147.	

1. The value reported is the lower of either MD or XD.

# PARADIENE 30 TG



## Commercial Product Data Sheet

### Product Description

Paradiene 30 TG is a high performance, torch grade modified bitumen finish ply designed for use in homogeneous multi-layer modified bitumen roof membrane systems. Paradiene 30 TG consists of a lightweight random fibrous glass mat impregnated and coated with high quality styrene-butadiene-styrene (SBS) modified bitumen, and surfaced with ceramic granules. The back surface is coated with a high performance modified asphalt adhesive layer specifically formulated for torch applications. The adhesive layer is manufactured using a special process that embosses the surface with a grooved pattern to provide optimum burnoff of the plastic film and maximize application rates.

### Product Uses

Paradiene 30 TG is the finish ply of the Siplast Paradiene 20 TG/30 TG System, and is lapped 3 inches (7.6 cm) side and end. Siplast Paradiene 20 TG/30 TG Systems are torch applied to approved substrates. Contact Siplast for specific approval on product uses.

### Product Approvals

Paradiene 30 TG is approved by FM Approvals (FM Standard 4470) for use in Siplast Paradiene 20 TG/30 TG Class 1 insulated steel roof deck constructions and insulated and non-insulated concrete roof deck constructions, subject to FM conditions and limitations.

Paradiene 30 TG is classified by Underwriters Laboratories for use in  $cUL_{us}$  Classified Siplast Paradiene 20 TG/30 TG Roof Systems. Siplast Paradiene 20 TG/30 TG Roof Systems have been classified as Class C roofing systems over combustible, non-combustible, and insulated combustible decks.

Paradiene 30 TG meets or exceeds the requirements of ASTM D 6163 Type I, Grade G, for SBS-modified bituminous sheet materials using glass fiber reinforcements.

Siplast Roof Systems also have received the approval of many regional and local authorities. Please contact Siplast for specific information as required.

### COMMERCIAL PRODUCT INFORMATION

Unit:	Roll		
Coverage:	0.75 Square	(7.0 m <sup>2</sup> )	
Coverage Weight Per Square:	Min:	112 lb	(5.4 kg/m <sup>2</sup> )
Roll Length:	Min:	25.25 ft	(7.70 m)
Roll Width:	Avg:	3.28 ft	(1.00 m)
Thickness:	Avg:	138 mils	(3.5 mm)
Thickness at Selvage:	Avg:	118 mils	(3.0 mm)
	Min:	114 mils	(2.9 mm)
Selvage Width:	Avg:	2.75 in	(70 mm)
Selvage Surfacing: Burn-off Polyolefin Film			

Top Surfacing: No. 11 ceramic granules, standard color finishes are #93 Bone White and #65 Cinnamon Brown. Contact Siplast for other available colors.

Back Surfacing: Polyolefin Film

Lines: A laying line is placed 3 in (7.6 cm) from selvage edge of the material. The line color for this material is blue.

Packaging: Rolls are wound onto a compressed paper tube. The rolls are placed upright on ends opposite the selvage on pallets cushioned with corrugated cardboard and are adhered with adhesive at the labels. The top of the palletted rolls is covered with foiled Kraft paper. The palletted material is protected by a heat shrink polyethylene shroud.

Pallet: 41 in X 48 in (104 cm X 122 cm) wooden pallet  
Number Rolls Per Pallet: 25  
Number Pallets Per Truckload: 18  
Minimum Roll Weight: 84 lb (38.1 kg)

Storage and Handling: All Siplast roll roofing products should be stored on end on a clean flat surface. Care should be taken that rolls are not dropped on ends or edges and are not stored in a leaning position. Deformation resulting from these actions will make proper installation difficult. All roofing should be stored in a dry place, out of direct exposure to the elements, and should not be double stacked. Material should be handled in such a manner as to ensure that it remains dry prior to and during installation.

Current copies of all Siplast Commercial Product Data Sheets are posted on the Siplast Web site at [www.Siplast.com](http://www.Siplast.com).

# PARADIENE 30 TG

## Physical and Mechanical Properties

Property (as Manufactured)	Values/Units	Test Method
Thickness (average)	138 mils (3.5 mm)	ASTM D 5147 section 6
<sup>1</sup> Thickness at selvage (minimum) (average)	114 mils (2.9 mm) 118 mils (3.0 mm)	ASTM D 5147 section 6
<sup>2</sup> Peak Load @ 73°F (average)	30 lbf/inch (5.3 kN/m)	ASTM D 5147 section 7
<sup>2</sup> Peak Load @ 0°F (average)	75 lbf/inch (13.2 kN/m)	ASTM D 5147 section 7
<sup>2</sup> Elongation @ Peak Load, 73°F (average)	3%	ASTM D 5147 section 7
<sup>2</sup> Elongation @ Peak Load, 0°F (average)	3%	ASTM D 5147 section 7
<sup>2</sup> Ultimate Elongation @ 73°F (average)	55%	ASTM D 5147 section 7
<sup>2</sup> Tear Strength (average)	40 lbf (0.18 kN)	ASTM D 5147 section 8
Water Absorption (maximum)	1%	ASTM D 5147 section 10
Dimensional Stability (maximum)	0.1%	ASTM D 5147 section 11
Low Temperature Flexibility (maximum)	-15°F (-26°C)	ASTM D 5147 section 12
Granule Embedment Max. avg. loss Max. individual loss	1.5 grams per sample 2.0 grams per sample	ASTM D 5147 section 15
Compound Stability (minimum)	250°F (121°C)	ASTM D 5147 section 16
Coating Thickness - Back Surface	≥ 40 mils (1 mm)	ASTM D 5147 section 17
Cyclic Fatigue	Paradiene 30 TG, bonded to an acceptable Paradiene 20 base ply with an approved method of attachment, passes ASTM D 5849 both as-manufactured and after heat conditioning according to ASTM D 5147.	

1. Measured on the selvage edge excluding the granule surfacing.
2. The value reported is the lower of either MD or XD.

# PARAFAST PA ROOFING FASTENER



## Commercial Product Data Sheet

### Product Description and Product Uses

The Parafast PA Roofing Fastener is a standard duty roofing screw that is pre-assembled with the Parafast 3-inch metal plate. The Parafast PA Roofing Fastener is designed to secure roof insulation and substrate panels, and base sheets in approved assemblies, to standard steel (18 ga. - 24 ga.), wood, and plywood roof decks. It is available in lengths from 2 1/4" to 8". It is Factory Mutual Approved and meets the code compliance requirements for Miami-Dade County, Florida.

### Product Application

The Parafast PA Roofing Fastener must penetrate steel decks a minimum of 3/4", and wood plank decks a minimum of 1". The fastener must completely penetrate plywood decks and extend a minimum 1/2" beyond the underside of the plywood. Using a screw gun recommended for roofing fasteners, drive the fastener until a slight depression is seen around the plate. When fastening through stiff, high-density rigid insulation boards, watch for the plate to dimple.

**Note:** Care must be taken to not overdrive the fastener and fracture the surface skin or facer of the panel. The fastener must be tight enough so that the plate doesn't turn.

For steel deck construction, Factory Mutual requires that the fastener penetrate the deck panel through the top flanges.

### Physical Data

Thread Diameter: .220

Head Diameter: .435

Head Style: #3 Phillips Truss Head

Drive Bit: #3 Phillips bit drive included in each carton.

### COMMERCIAL PRODUCT INFORMATION

Product No.	Length	Thread Length	Units/Box	Box Weight
P214	2 1/4"	Full	250	15 lb
P278	2 7/8"	2 5/8"	250	16 lb
P314	3 1/4"	3"	250	17 lb
P334	3 3/4"	3"	250	18 lb
P412	4 1/2"	3"	250	19 lb
P500	5"	3"	250	20 lb
P600	6"	4"	250	21 lb
P700	7"	4"	250	23 lb
P800	8"	4"	250	24 lb

Packaging: Corrugated boxes

Sizes: 2 1/4" - 3 1/4" 14 in X 14 in X 10 in  
3 3/4" 14 in X 14 in X 12 in  
4 1/2" - 5" 14 in X 14 in X 15 in  
6" - 8" 14 in X 14 in X 19 in

Pallet: 44 in X 44 in (112 cm X 112 cm) wooden pallet  
No. Pallets/TL: 24-26

**Note:** Sizing selection procedure is located on the back side of this page.

Current copies of all Siplast Commercial Product Data Sheets are posted on the Siplast Web site at [www.Siplast.com](http://www.Siplast.com).

# PARAFAST PA ROOFING FASTENER

## PARAFAST PA ROOFING FASTENER LENGTH SELECTION PROCEDURE

- 1. If applicable, determine thickness of existing roofing material.
- 2. Add thickness of new insulation.
- 3. Add 3/4" minimum fastener penetration.
- 4. If odd size requirement, always size up in length, not down. See example.

Example

Existing Roofing	<u>1 3/4"</u>
New Insulation	<u>1/2"</u>
Min. Embedment	<u>3/4"</u>
Total Fastening Range	<u>3"</u>

Existing Roofing	_____
New Insulation	_____
Min. Embedment	<u>3/4"</u>
Total Fastening Range	_____

Use this form to calculate your correct fastener size.

The proper fastener length for this example is 3 1/4".

**N° DE STOCK : 0910003 (1,22 m X 2,44 m) 4' X 8'**  
**0910006 (1,22 m X 1,52 m) 4' X 5'**  
**0910020 (1,22 m X 3,04 m) 4' X 10'**  
**0910033 (1,22 m X 1,22 m) 4' X 4'**

**Septembre 2010**

## **PROTECTOBOARD – (1/4 po)**

Le panneau de recouvrement ProtectoBoard est formé de deux nattes extra résistantes de voile de verre protégeant un noyau de bitume renforcé de minéraux. Dans le domaine de la toiture, le modèle 6,0 mm (1/4 po) peut s'utiliser dans un système de toiture inversée ou, s'il s'agit d'une réfection, comme nouveau substrat pour une application de bitume modifié ou multicouche. De plus, le panneau ProtectoBoard s'utilise comme protection afin d'imperméabiliser les plate-formes de ponts et de supports, les murs verticaux et les stationnements à étages. Les produits pour toitures IKO sont conçus et fabriqués en tenant compte de la responsabilité environnementale de l'entreprise et de la durabilité écologique; ils sont faits de composantes recyclées de qualité et fabriqués dans des usines qui se conforment aux règles gouvernementales les plus rigoureuses. De ce fait, ils peuvent s'incorporer à tout projet de construction écologique.

PRODUITS	POIDS kgs (lbs)	LONGUEUR mm (pi)	QTÉ/PALETTE
1,22 m X 2,44 m (4' X 8') :	25,1 (55,4)	2 439 (8)	60
1,22 m X 1,52 m (4' X 5') :	15,7 (34,6)	1 524 (5)	85
1,22 m X 3,04 m (4' X 10') :	31,5 (69,3)	3 048 (10)	40
1,22 m X 1,22 m (4' X 4') :	12,6 (27,7)	1 219 (4)	110

CARACTÉRISTIQUES	UNITÉS DE MESURE	VALEUR NOMINALE	MÉTHODES D'ESSAI	LIMITES NORMALISÉES
<b>ÉPAISSEUR :</b>	mm (po)	6 (1/4)	-	± 10%
<b>TENEUR EN EAU :</b>	%	RÉUSSI	ASTM D146	MAX : 5
<b>ABSORPTION D'EAU :</b>	%	RÉUSSI	DSM #9,90,60	MAX : 5
<b>STABILITÉ DIMENSIONNELLE :</b>	%	RÉUSSI	ASTM D1204	MAX : 1,0

*Les données contenues dans la présente Fiche de données techniques, qui résultent d'essais en laboratoire et de mesures en cours de production, sont réputées être exactes et fiables et sont fournies aux utilisateurs aux seules fins d'examen, d'étude et de vérification. Rien dans la présente ne constitue une garantie que le fabricant pourrait être légalement tenu d'honorer. Le fabricant décline toute responsabilité à l'égard de toute supposition ou erreur d'interprétation de la part du lecteur.*

## **ACFoam®-IV Specifications**

### **Division 07 Thermal and Moisture Protection**

#### **Section 07 22 00 - Roof and Deck Insulation**

#### **Section 07 22 16 - Roof Board Insulation**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A.** HCFC FREE Polyiso Rigid board type roof insulation(s) for thermal protection as part of roofing assemblies.
- B.** Recover board Polyiso roof insulation.
- C.** Roofing crickets.

#### **1.2 RELATED SECTIONS**

- A.** Section 05 30 00 - Metal Decking.
- B.** Section 06 10 00 - Rough Carpentry: Roof blocking and nailers.

#### **1.3 REFERENCES**

*Specifier Note: (finish article heading number in sequential order)*

- A.** ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Insulation Board.
- B.** ASTM D 312 - Standard Specification for Asphalt Used in Roofing.
- C.** ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
- D.** ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- E.** FM 4450 - Approval Standard - Class I Insulated Steel Roof Decks.
- F.** FM 4470 - Approval Standard - Class I Roof Covers.
- G.** FS HH-I-1972/1 - Insulation Board, Thermal, Polyurethane or Polyisocyanurate, Faced with Aluminum Foil on Both Sides of the Foam.
- H.** FS HH-I-1972/2 - Insulation Board, Thermal, Polyurethane or Polyisocyanurate, Faced with Asphalt/Organic Felt, Asphalt/Asbestos Felt, or Asphalt/Glass Fiber Felt on Both Sides of the Foam.
- I.** FS HH-I-1972/3 - Insulation Board, Thermal, Polyurethane or Polyisocyanurate, Faced with Perlite Insulation Board on One Side and Asphalt/Organic Felt or Asphalt/Glass Fiber Felt on the Other.

*Specifiers Note: The above mentioned FS references are no longer applicable but may still be in some house master specs - it is recommended to remove these*

- J.** LTTR - Long Term Thermal Resistance predicted by CAN/ULC-S770-03.
- K.** UL 263 - Fire Tests of Building Construction and Materials.
- L.** UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.
- M.** UL 1256 - Fire Test of Roof Deck Constructions.
- N.** ASTM E 2114-01 - Standard Terminology for Sustainability Relative to the Performance of Buildings
- O.** ASTM E 2129 -01 - Standard Practice for Data Collection for Sustainability Assessment of Building Products.

#### **1.4 DEFINITIONS**





*Specifier Note: Define unusual terms not explained in the Contract Documents but are used in unique ways not included in standard references. This article is rarely used BUT this is a new term as of 2003.*

**A.** LTTR (Long Term Thermal Resistance) is defined as using techniques from ASTM C1303 or CAN/ULC-S770, the predicted R-Value that has been shown to be equivalent to the average performance of a permeably faced foam insulation product over 15 years. LTTR applies to ALL foam insulation products with blowing agents other than air, such as polyiso, extruded polystyrene and polyurethane. The new method is based on consensus standards in the US and Canada.

## 1.5 SUBMITTALS

**A.** Submit under provisions of Section 01 30 00 and 01 60 00.

**B.** Product Data:

1. Manufacturer's specifications.
2. Installation instructions for insulation board and fasteners.
3. Product Data as per ASTM 2129 - 01 Standard for Data Collection for Sustainability Assessment of Building Products.

**C.** Samples:

1. Submit 6 by 6 inch (152 by 152 mm) samples of each board type required.
2. Submit samples of each fastener type required.

**D.** Shop Drawings: Roof plan showing layout of boards and fastening patterns.

**E.** Certificates: System Manufacturer's or insulation manufacturer's certification that the insulation meets Zero ODP (Ozone Depletion Potential) and Zero GWP (Global Warming Potential) specification requirements.

**F.** Thermal Warranty: Submit sample warranty indicating conditions and limitations.

## 1.6 QUALITY ASSURANCE

**A.** Regulatory Requirements:

**\*\*\* VERIFY WITH APPLICABLE GOVERNING AGENCIES THE SPECIFIC STANDARDS TO BE COMPLIED WITH AND RETAIN, DELETE OR ADD ADDITIONAL REQUIREMENTS BELOW. \*\*\***

1. American Society for Testing and Materials (ASTM).
2. Federal Specifications (FS).

*Specifiers Note: The FS references are no longer applicable but may still be in some house master specs - it is recommended to remove these*

3. Factory Mutual (FM).
4. Underwriters Laboratories Inc. (UL) Classification.
5. Metro-Dade County, Florida Product Control.
6. California State Insulation Quality Standards and Title 25 Foam Flammability Criteria.
7. IBC, BOCA, ICBO and SBCCI Sections on Foam Plastic Insulation.
8. Canadian Compliance: CAN/ULC.

## 1.7 DELIVERY, STORAGE AND HANDLING

**A.** Comply with general requirements specified in Section 01 65 00.

**B.** Deliver insulation in packages labeled with material name, thermal value and product code.

**C.** When stored outdoors, stack insulation on pallets above ground or roof deck and cover with tarpaulin or other suitable waterproof coverings. Slit or remove manufacturer's packaging before covering with waterproof covering.

## 1.8 PROJECT CONDITIONS



- A.** Comply with insurance underwriter's requirements applicable for products of this Section.
- B.** Do not install insulation on roof deck when water of any type is present. Do not apply roofing materials when substrate is damp or wet.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A.** Acceptable Manufacturers: Atlas Roofing Corporation, \_\_\_\_\_  
Atlas Roofing Corporation,  
2000 RiverEdge Pkwy, Suite 800, Atlanta, GA 30328.  
Ph. (770) 952-1442  
Fax (770) 952-3170
- B.** Local Representative(s): Atlas Roofing Corporation \_\_\_\_\_,  
\_\_\_\_\_.

**\*\*\* INSERT NAME, ADDRESS AND PHONE NUMBER. \*\*\***

- C.** Substitutions: Not permitted.
- D.** Provide polyiso roof board insulation from a single manufacturer.

### **2.2 MATERIALS**

- A.** Polyiso Roof Board Insulation: Provide products that comply with the following:
  - 1.** ASTM standards specified.
  - 2.** Factory Mutual (FM) approvals specified.
  - 3.** Underwriters Laboratories Inc. (UL) classifications specified.
  - 4.** Metro-Dade County, Florida Product Control.
  - 5.** California State Insulation Quality Standards and Title 25 Foam Flammability Criteria.
  - 6.** BOCA National Building Code Section on Foam Plastic Insulation
  - 7.** ICBO Uniform Building Code Section on Foam Plastic Insulation.
  - 8.** SBCCI Standard Building Code Section on Foam Plastic Insulation.
  - 9.** Canadian Compliance: CAN/ULC and CCMC.

**B.** ACFoam-II, -III, and -IV: Closed-cell HCFC FREE "Green" polyisocyanurate foam core manufactured using [HCFC] [ACUltrahydrocarbon] blowing agent and integrally laminated to heavy non-asphaltic fiber-reinforced felt facers; FM [1-60] [1-90] wind uplift classification; compressive strength - [20 psi] [25 psi].

Federal Specification HH-I-1972/GEN and HH-I-1972/2, Class 1 have been cancelled.

ASTM C 1289, Type II, Class 1

Miami-Dade County, Florida Product Control No. 00-0208.04

NYC MEA #107-01-M

California State Insulation Quality Standards and Title 25 Foam Flammability Criteria (License #TC 1231)

IBC, NBC, UBC and SBC Sections on Foam Insulation (Chapter 26)

CCMC No. 12464-L

CAN/CGSB-51.26-M86

CAN/ULC-S704

### **FM Standard 4450/4470 Approval**

ACFoam-II, -III, and -IV are approved for Class 1 insulated steel, wood, concrete and gypsum roof deck construction for 1-60 and 1-90 Windstorm Classifications (may be mopped or mechanically fastened to concrete roof decks). Refer to FM Approval Guide for details on specific systems.



### **UL Standard 1256 Classification**

Insulated metal deck construction assemblies - Construction #120 and #123.

### **UL Standard 790 (ASTM E 108) Classification**

Class A with most roof membrane systems. See UL Roofing Materials & Systems Directory.

### **UL Standard 263 Fire Resistance Classification (ASTM E 119)**

Some classifications for fire resistance are P225, P230, P259, P508, P510, P514, P519, P701, P710, P713, P717, P718, P719, P720, P722, P723, P724, P725, P727, P728, P729, P730, P732, P801, P814, P815, P818, P819, and P828. See UL Fire Resistance Directory for updated listings.

### **UL Standard 1897 Uplift Resistance**

120 psf, 150 psf, 165 psf, 245 psf.

### **UL Certified for Canada**

#### **UL of Canada**

Insulated Roof Deck Assemblies - Construction #C34.

CAN/ULC-S126-M86, CAN/ULC-S101-M89, CAN/ULC-S107-M87

#### **\*\*\* INSERT REQUIRED "R" VALUE BELOW. \*\*\***

**C. LTTR - Insulation "R" Value:**\* Long-term thermal resistance values of the foam were determined in accordance with CAN/ULC-S770. All test samples were third-party selected and tested by an accredited materials testing laboratory.

**D.Related Materials:**

- 1.** Fasteners: Factory Mutual approved.
- 2.** Base Ply: As recommended by membrane manufacturer.
- 3.** Fasteners: For Nail Base and Vented-R: Atlas Nail Base Fasteners.
- 4.** Asphalt Bitumen: Comply with ASTM D 312, Type III (steep) or Type IV. USE ONLY ON APPROVED BOARD INSULATION TYPES.
  - a.** Provide with labels indicating flash point, softening point, finished blowing temperature, and equiviscous temperature.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A.** Examine roof deck for suitability to receive insulation. Verify that substrate is dry, clean and free of foreign material that will damage insulation or impede installation.
- B.** Verify that roof drains, scuppers, roof curbs, nailers, equipment supports, vents and other roof accessories are secured properly and installed in conformance with Contract Drawings and submittals.
- C.** Verify that deck is structurally sound to support installers, materials and equipment without damaging or deforming work.
  - 1.** Start of installation indicates installer accepts conditions of existing deck surfaces.

### **3.2 APPLICATION / INSTALLATION**

**\*\*\* VERIFY NEED FOR A VAPOR RETARDER WITH DESIGNER IN ACCORDANCE WITH CURRENT VAPOR RETARDER THEORY AND ENGINEERING FORMULAS. WHEN REQUIRED, INSERT INSTALLATION REQUIREMENTS OF VAPOR RETARDER MANUFACTURER. .\*\*\***

*Specifiers Note: Atlas strongly recommends the use of a vapor retarder with a perm rating of 0.5 or*



*less (i.e., 4 mil polyethylene minimum) on all projects except those in extreme cooling climates.*

**A.** Install specified insulation using approved [mechanical fasteners] [hot asphalt] [adhesives] in accordance with manufacturer's latest written instructions and as required by governing codes and Owner's insurance carrier.

**B.** Install with end joints staggered to avoid having insulation joints coinciding with joints in deck. In multi-layer installations, stagger joints in top and bottom layers.

**\*\*\* NOTE TO SPECIFIER: ATLAS SUPPORTS NRCA AND OTHER INDUSTRY AUTHORITIES IN RECOMMENDING MULTI-LAYER INSULATION APPLICATIONS. (SEE TECHNICAL BULLETIN #00-01) \*\*\***

### **3.3 CLEANING / PROTECTION**

**A.** Remove trash and construction debris from insulation surface prior to application of roofing membrane.

**B.** Do not leave installed insulation exposed to weather. Cover and waterproof with completed roof system immediately after installation.

**1.** Temporarily seal exposed insulation edges at the end of each day.

**2.** Remove and replace installed insulation that has become wet or damaged with new insulation.

**C.** Protect installed insulation and roof cover from traffic by use of protective covering materials during and after installation.



**Tradesman**

# TRADESMAN® SBS GLASS SA BASE

## Product Description

Tradesman SBS Glass SA Base is a modified bitumen base ply designed for use in modified bitumen roof membrane systems. Tradesman SBS Glass SA Base consists of a lightweight random fibrous glass mat impregnated and coated with styrene-butadiene-styrene (SBS) modified bitumen. The bottom surface is coated with a self-adhesive bitumen blend protected with a release film. The top surface is covered with a mineral parting agent.

## Product Uses

SBS Glass SA Base is intended for use with Tradesman SBS cap sheets and is lapped 3 inches (76 mm) side and end. Alternatively, SBS Glass SA Base may be used as a temporary roof membrane or as a vapor retarder component (specifier should determine appropriateness based on physical and mechanical properties). SBS Glass SA Base sheets are applied to substrates appropriate for self-adhesive membranes. After applying to the substrate, the membrane should be rolled with a weighted roller to enhance adhesion. Ambient and substrate temperatures below 50°F may require the use of a high tack primer and/or supplemental heat applied to the product to ensure adhesion to the substrate. Side and end laps should be rolled with adequate pressure to achieve complete contact and heat sealed.

## Commercial Product Information

Unit:	Roll
Coverage:	2 Squares
Coverage Weight Per Square:	Avg: 43 lb (19.5 kg)
Roll Length:	Min: 66 ft (20.2 m)
Roll Width:	Avg: 3.28 ft (1.0 m)
Thickness:	60 mils ± 7% (1.5 mm ± 7%)
Selva Width:	Avg: 3.0 in (76 mm)
Selva Surfacing:	Release Tape
Top Surfacing:	Mineral parting agent
Back Surfacing:	Release Film

Packaging: Rolls are placed upright on ends on pallets. The palletized material is shrink-wrapped.

Pallet: 48 in x 42 in (1.21 m x 1.06 m)  
 Number of Rolls Per Pallet: 20  
 Number of Pallets Per Truckload: 20  
 Average Roll Weight: 85 lb (38.6 kg)

Storage and Handling: Tradesman roll roofing products should be stored on end on a clean flat surface. Rolls should not be dropped on ends or edges and should not be stored in a leaning position. Deformation resulting from improper storage and handling will make proper installation difficult. All roofing should be stored in a dry place, out of direct exposure to the elements, and should not be double stacked. Ensure that material remains dry prior to and during installation.

Tradesman  
 P.O. Box 1024  
 Euless, TX 76039  
 Tel 866 389 8682  
 Fax 866 389 8683



## Tradesman SBS Glass SA Base Physical and Mechanical Properties

<u>Property (as manufactured)</u>	<u>Values/Units</u>	<u>Test Method</u>
Thickness (average)	60 mils $\pm$ 7% (1.5 mm $\pm$ 7%)	ASTM D 5147 Section 5
Peak Load @ 73°F (average)	30 lbf/in (5.3 kN/m)	ASTM D 5147 section 6
Elongation @ Peak Load, 73°F (average)	3%	ASTM D 5147 section 6
Tear Strength (average)	40 lbf (0.18 kN)	ASTM D 5147 section 7
Water Absorption (maximum)	1%	ASTM D 5147 section 9
Dimensional Stability (maximum)	0.1%	ASTM D 5147 section 10
Low Temperature Flexibility (maximum)	-0.4°F (-18°C)	ASTM D 5147 section 11
Compound Stability (minimum)	215°F (102°C)	ASTM D 5147 section 15
Water Vapor Transmission	< 0.12 perms	ASTM 96, B

Tradesman reserves the right to alter the composition of its materials without prior notice.